

DIESEL SERVICE TECHNOLOGY II

Diesel Service Technology II includes classroom and laboratory experiences concerned with all phases of repair work on diesel electrical systems used to power buses, ships, trucks, railroad trains, electrical generators, construction machinery, and similar equipment. Instruction and practice is provided in the diagnostics and repair of electrical/electronic systems. Students will demonstrate performance of these tasks as defined by ASE/NATEF standards. Use of technical manuals, hand and power tools and testing and diagnostic equipment are also studied in the course. Instruction in personal and environmental safety practices as related to OSHA and other agencies that affect individuals working in the ground transportation technology areas will also be covered. This course addresses the fundamental theories of electricity and electronics as applied to ground transportation technology areas. Utilization of analog and digital meters, wiring diagrams, and other diagnostic tools will be stressed in a hands-on course that introduces the student to automotive electrical theory, batteries, charging systems, starting systems, wiring repairs, lighting systems and accessories.

- DOE Code: 5624
- Recommended Grade Level: Grade 12
- Recommended Prerequisites: Diesel Service Technology I
- Credits: 2-3 credits per semester, maximum of 6 credits
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- This course is aligned with postsecondary courses for Dual Credit:
 - Vincennes University
 - AUTO 105- Transportation Fundamentals
 - AUTO 110/L- Transportation Electrical and Lab

Dual Credit

This course provides the opportunity for dual credit for students who meet postsecondary requirements for earning dual credit and successfully complete the dual credit requirements of this course.

Application of Content and Multiple Hour Offerings

Intensive laboratory applications are a component of this course and may be either school based or work based or a combination of the two. Work-based learning experiences should be in a closely related industry setting. Instructors shall have a standards-based training plan for students participating in work-based learning experiences. When a course is offered for multiple hours per semester, the amount of laboratory application or work-based learning needs to be increased proportionally.

Career and Technical Student Organizations (CTSOs)

Career and Technical Student Organizations are considered a powerful instructional tool when integrated into Career and Technical Education programs. They enhance the knowledge and skills students learn in a course by allowing a student to participate in a unique program of career and leadership development. Students should be encouraged to participate in SkillsUSA, the CTSO for this area.

Content Standards

Domain – Workplace Competency

Core Standard 1 Students demonstrate employability skills to prepare for diesel service careers or additional training opportunities.

Standards

- DSTII-1.1 Allocate the appropriate resources for task completion
- DSTII-1.2 Demonstrate effective interpersonal skills
- DSTII-1.3 Develop leadership skills
- DSTII-1.4 Establish positive relationships with people from diverse backgrounds
- DSTII-1.5 Research, analyze, and use data for work assignments
- DSTII-1.6 Apply effective critical thinking, decision making, and problem-solving techniques
- DSTII-1.7 Implement quality assurance measures and safeguards
- DSTII-1.8 Read and interpret written materials
- DSTII-1.9 Apply written communication skills
- DSTII-1.10 Demonstrate effective listening and speaking skills
- DSTII-1.11 Perform appropriate mathematical calculations correctly
- DSTII-1.12 Exhibit a responsible work ethic
- DSTII-1.13 Demonstrate accepted standards for ethical behavior

Domain – Career Development

Core Standard 2 Students construct personal goals to structure successful paths recognized by business and industry.

Standards

- DSTII-2.1 Evaluate employment and career pathway opportunities related to established career interest(s)
- DSTII-2.2 Create a continuing education plan that identifies further education and training options
- DSTII-2.3 Prepare for exams leading to certifications recognized by business and industry
- DSTII-2.4 Develop skills needed to enter the workforce
- DSTII-2.5 Evaluate resources that keep workers current in the career field
- DSTII-2.6 Demonstrate skills and attitudes needed for lifelong learning
- DSTII-2.7 Apply effective money management strategies

Domain –I Electrical Systems

Core Standard 3 Students analyze all components of Diesel electrical systems to determine corrective actions needed for diagnosis and repair.

Standards

- DSTII-3.1 Demonstrate an understanding of personal and shop safety practices
- DSTII-3.2 Identify various types of fasteners and their grades
- DSTII-3.3 Take both standard and metric measurements with various types of measuring devices
- DSTII-3.4 Explain how a modern Diesel battery works
- DSTII-3.5 Explain how a modern starting motor works
- DSTII-3.6 Demonstrate an understanding of how a modern charging system works
- DSTII-3.7 Demonstrate an understanding of how a modern lighting system works
- DSTII-3.8 Utilize modern automotive testing equipment

- DSTII-3.9 Diagnose common electrical problems in a modern vehicle
- DSTII-3.10 Interpret a modern wiring diagram
- DSTII-3.11 Diagnose and repair electrical and electronic fuel systems
- DSTII-3.12 Diagnose and repair electrical and electronic components of the lubrication systems
- DSTII-3.13 Analyze and repair electrical and electronic components of the heating/cooling system
- DSTII-3.14 Assess and repair electrical and electronic components of the intake and exhaust systems
- DSTII-3.15 Diagnose electrical and electronic components that effect engine performance
- DSTII-3.16 Inspect and repair electrical and electronic components of the pneumatic/hydraulic braking systems
- DSTII-3.17 Organize, research, and implement a complete preventive maintenance and inspection (P.M.I.)

Process Standards

Common Core Literacy Standards for Technical Subjects

Reading Standards for Literacy in Technical Subjects 11-12

The standards below begin at grade 11 and define what students should understand and be able to do by the end of grade 12. The CCR anchor standards and high school standards in literacy work in tandem to define college and career readiness expectations – the former providing broad standards, the latter providing additional specificity.

Key Ideas and Details

- 11-12.RT.1 Cite specific textual evidence to support analysis of technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
- 11-12.RT.2 Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
- 11-12.RT.3 Follow precisely a complex multistep procedure when performing technical tasks; analyze the specific results based on explanations in the text.

Craft and Structure

- 11-12.RT.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific context relevant to *grades 11-12 texts and topics*.
- 11-12.RT.5 Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
- 11-12.RT.6 Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.

Integration of Knowledge and Idea

- 11-12.RT.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

- 11-12.RT.8 Evaluate the hypotheses, data, analysis, and conclusions in a technical subject, verifying the data when possible and corroborating or challenging conclusions with other sources of information.
- 11-12.RT.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

Range of Reading and Level of Text Complexity

- 11-12.RT.10 By the end of grade 12, read and comprehend technical texts in the grades 11-CCR text complexity band independently and proficiently.

Writing Standards for Literacy in Technical Subjects 11-12

The standards below begin at grade 11 and define what students should understand and be able to do by the end of grade 12. The CCR anchor standards and high school standards in literacy work in tandem to define college and career readiness expectations – the former providing broad standards, the latter providing additional specificity.

Text Types and Purposes

- 11-12.WT.1 Write arguments focused on *discipline-specific content*.
- 11-12.WT.2 Write informative/explanatory texts, including technical processes.
- 11-12.WT.3 Students will not write narratives in technical subjects. *Note: Students' narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively into arguments and informative/explanatory texts. In technical, students must be able to write precise enough descriptions of the step-by-step procedures they use in their technical work that others can replicate them and (possibly) reach the same results.*

Production and Distribution of Writing

- 11-12.WT.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- 11-12.WT.5 Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.
- 11-12.WT.6 Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.

Research to Build and Present Knowledge

- 11-12.WT.7 Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
- 11-12.WT.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation
- 11-12.WT.9 Draw evidence from informational texts to support analysis, reflection, and research.

Range of Writing

11-12.WT.10 Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.